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ABSTRACT

The purpose of a practicum was to develop an effective and valid human resource development plan based on a view of the practitioner of the future. The targeted program was one in radiography (radiologic technology) co-sponsored by Lincoln Land Community College and St. John's Hospital (Illinois). A review of the literature was used to establish a view of the practicing radiographer of the year 2000 and beyond. A formative committee, a selected panel of experts in the field, validated this vision. Subsequent development of the human resource plan involved the formulation of seven major assumptions based on four sources: (1) the view of the future radiographer described in the literature review; (2) development of five major goals for the program from the assumptions; (3) integration of these goals with goals from the previous plan, leading to six human resource priorities for the radiography program; and (4) development of an evaluative section to use the plan to improve program effectiveness. This plan was approved by the program advisory committee and validated through a questionnaire administered to a small group of committee members. Recommendations concerned implementation of the plan and annual evaluation. (Appendixes include a list of 63 references, original human resource plan, the integrated human resource plan, and evaluation questionnaire.) (YLB)

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A HUMAN RESOURCE DEVELOPMENT ACTION PLAN FOR THE RADIOGRAPHY PROGRAM SPONSORED BY LINCOLN LAND/ST.JOHN'S BASED ON A VIEW OF THE RADIOGRAPHER OF THE FUTURE

Human Resource Development

by

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A Practicum Report presented to Nova University in partial fulfillment of the requirements for the degree of Doctor of Education

Nova University

August 1991

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A HUMAN RESOURCE DEVELOPMENT ACTION PLAN FOR THE RADIOGRAPHY PROGRAM SPONSORED BY LINCOLN LAND/ST.JOHN'S BASED ON A VIEW OF THE RADIOGRAPHER OF THE FUTURE

By

Steven B. Dowd

Programs in radiography must often be reactive rather than proactive in planning. Lincoln Land Community College and St. John's Hospital, as forward-looking providers of education and patient care, as well as co-sponsors of a program in radiography (radiologic technology), have an interest in developing their human resources to meet future challenges. The purpose of this practicum was to develop an effective and valid human resource development plan based on a view of the practitioner of the future.

A review of the literature was used to come to a view of the practicing radiographer of the year 2000 and beyond. This vision was validated by a formative committee, leading to the development of a human resource plan. This involved the development of major assumptions, major goals, priorities, and an evaluative section. This plan was approved by the program advisory committee, and validated through a questionnaire administered to a small group of committee members.

This method of human resource development planning proved to be useful in a preliminary manner. It is recommended that the long-term plan be implemented as developed, as well as evaluated on an annual basis. This human resource development plan has become part of the program's Master Plan. It is also recommended that the database be periodically updated and that this method of planning be further disseminated at the professional level and to potential and current students.

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Chapter 1

INTRODUCTION

Background and Significance

Underlying Problem

Planning in allied health education is unfortunately more often reactive than proactive. Preparation for the "organization of the future," as described by Groff (1989), is uncommon. Programs in radiologic technology, for example, have had to be reactive to changes in health care and employer demands such as new imaging modalities, outpatient care, and multicompetency.

The organization of the future, and an organization with a view to the future, will best train the practitioner of the future. A variety of information exists that hints at the practitioner of the future and the education of this individual: economic forecasts, futurism, technical developments, and so on. This information can be synthesized to come to a view of the practitioner of the future.

Purpose of the Investigation

The purpose of this investigation was to develop and validate strategic planning for human resource development of the faculty and staff associated with the program in radiologic technology sponsored by Lincoln Land Community College and St. John's Hospital. Groff (1982) has noted that futurism can be integrated into strategic planning of an institution. This

planning process integrated a view of the radiographer of the future into the current human resource plan of the program.

Significance to the Institution

The radiography program sponsored by Lincoln Land Community College, a comprehensive community college in Springfield, Illinois, has enjoyed full accreditation of its radiography program for many years. Offered in conjunction with St. John's Hospital, an 800-bed teaching hospital also located in Springfield, the program is offered in a very cost-effective manner through co-sponsorship.

As an excellent program that operates in full realization of the obligations it serves to the citizens of its district and those in need of health care, there is a need to plan for developments in the profession on a proactive basis. Groff (1986) states that the mission of vocational education is to provide a skilled workforce for society. This planning involves devising "scenarios for preferred alternative futures."

Relationship to the Seminar

Groff (1990) has also developed a vision of the human resource department of the year 2000. The goal of this report was to expand on this vision, which led to a strategic plan relevant to human resource development that will allow the program to capitalize on strengths, minimize weaknesses, take advantage of opportunities, and eliminate or reduce threats. In the seminar,

it has also been noted that maximum synergism will come about if organizational development is matched with human resource development.

Research Question

What is an effective and valid strategic action plan for the human resource development of the Lincoln Land/St. John's radiologic technology program faculty and staff in relation to the practitioner of the future?

Chapter 2

REVIEW OF THE LITERATURE

Introduction

This review of the literature will consist of six basic sections. First, a vision of the future will be presented. Then, a vision of the future in health care will be discussed. A review of topics (articles) appearing in the radiologic technology literature will be listed as a "window" to the future. Next a vision of the future of education will be discussed. This information will be used to come to a synthesized version of a view of the future radiographer. Finally, the use of futures information in planning, especially human resource development planning, will be discussed.

A Vision of the Future

Amercia was reawakened to futures thinking and planning in the early 1980's through Toffler's (1980) concept of The Third Wave and Naisbitt's (1982) Megatrends. Toffler analogizes societal change with "waves"- the first wave of change being a move to an agricultural society; the second wave was the industrial society; and the current third wave being the technological society.

The Workforce 2000 report (Johnston and Packer, 1987) analyzed key trends that would change America. Five demographic facts are seen by the authors as most important:

1. The population and the workforce will grow slowly;

2. The average age of the population and the workforce will rise. The pool of young workers entering the labor market will shrink.
3. More women will enter the workforce.
4. Minorities will take a larger share of the labor force.
5. Immigrants will again represent the largest share of the increase in the population and workforce, which has not been true since World War I.

Along with these changes, the nature of the job market will change, leading to unique challenges. The fastest growing jobs will be in fields that require high levels of education and skills: the professions, technology, and sales. Jobs will be ranked according to skill, not education.

The United Way of America's Strategic Institute has identified over 100 societal trends, grouping them into nine forces that would "reshape America". Most important is the maturation of America, and next what they term the mosaic society. That is, we are moving from a "melting pot" where everyone expects to become assimilated into American culture to a system where many retain their special heritages. Also cited in the report were redefinition of individual and societal roles, the information-based society, globalization, personal and environmental health, economic restructuring, redefinition of

family and home, and rebirth of social activism. (United Way Strategic Institute, 1989)

A Vision of the Future in Health Care

Health Care in General

A variety of recent articles in the allied health literature have analyzed the future of health care. Clarence Bezold (1989), the executive director of the Institute for Alternative Futures, feels that health care must try to forecast factors of change in order to best control the future environment. He lists the following as "Key Areas of Change":

1. Health Conditions and Health Promotion
   a. Aging
   b. The Compression of Morbidity
   c. The Science of Dying
2. Medical and Health Care Practice
   a. Information Technology and Health Care:
      1. Medical Records
      2. Expert Systems
      3. The Hospital on the Wrist
      4. Personal, Biochemically Unique Medical Information

b. Self-Care

c. Biomedical Research and New Medicines

d. Alternative Therapies

e. Health Care Providers

f. Licensure of Physicians

3. Health Care Financing and Delivery

a.Smarter Markets:

1. Health Outcome Measures

2. Consumer Activism

b. Changing Incentives in US-Capitated Care

c. Percent of GNP for Health Care

Bezold made five recommendations for allied health programs and the deans of its schools:

1. Students should have a capacity for future thinking of at least twenty years and preferably fifty years in advance.
2. Professional associations and schools must also develop a similar future-thinking approach.
3. All of the allied health professions should be able to understand the opportunities and threats that will surface in the future.
4. Research on the cost-effectiveness of allied health care is of particular importance to justify the professions' worth.

5. State commissions on health care must include allied health professions, and adopt a futures perspective.

Elder (1990) conducted a Delphi study of members of the College of Health Deans to rate and discuss their views on developments in health care. The ten top developments in health care that would have a great effect by the year 2000 were:

1. Aging
2. Rehabilitative services
3. The manpower shortage
4. Computer technology
5. Prosthetics
6. Chronic disease
7. Increase in ambulatory services
8. Increase in home health
9. Increased automation
10. AIDS

The deans responding to Elder's Delphi survey felt that the following ten objectives were of most importance to allied health and to be achieved by the year 2000:

1. Increase the number of minorities - faculty and students.
2. Develop doctorally-prepared faculty.
3. Incorporate gerontology into curricula.
4. Incorporate computer and video technology in instruction.

5. Increase the use of extended care for clinical.
6. Use computers in clinical and didactic settings.
7. Increase the use of ambulatory care for clinical.
8. Incorporate cultural diversity.
9. Increase program size as needed.
10. Develop closer relations between nursing and allied health.

A Delphi study of the Board of Directors of the American Society for Healthcare Education (Ulschak and SnowAntle, 1990) identified four major trends that would significantly influence the future of health care:

1. Health care staffing and resource shortage (identified by 84% of the respondents).
2. Financial stability.
3. Management of change.
4. Changing patient base.

Only thirty-five percent of respondents named "rapid technological explosion" as a significant trend. This was the only study to assign such a low rating to technology cited here.

Selker and Broski (1991) have identified thirteen factors that will affect the practice of allied health professionals:

1. Cost containment.
2. Health promotion and disease prevention.
3. Home care.

4. Informal caregiving.

5. Geriatric Imperative.

6. Catastrophic care.

7. Medical technology.

8. Growth of chronic care.

9. Policy foci on maternal/child health and aging.

10. Mainstreaming people with disabilities.

11. Assurance of quality outcomes.

12. Competition and consumerism.

13. Globalization.

The next two subsections of this literature review will discuss two factors important for an analysis of future trends in health care. First, the relationship of technology to health care will be presented. Then the relationship between technology and the caring dimension of health care will be discussed.

Technology and Health Care

Health care has been strongly driven by technology in the 20th century, which has given imaging one of the strongest roles in health care. Berk, Monheit, and Hagan (1988) and Russell (1979) cite "expensive technology" as the main contributor to increases in expenditures in healthcare from 1963 to 1970. This trend is expected to continue. Kiplinger and Kiplinger (1989) state that, "In 20 years, we've moved from x-rays to computed tomography (CT) to magnetic resonance imaging (MRI), which produces extraordinary pictures of the internal body without the

risk of x-rays." A recent Hospitals magazine article (November 5,1990) stated that spending on imaging equipment would total about $3.4 billion in 1990, and would rise to $5 billion by 1995.

America is seen as a leader in medical technology, a trend that should also continue (Read and Campbell, 1988). The shipping of medical devices overseas rises at rate of about eight percent per year (U.S. Congress Data, 1984). A recent Cable News Network special (July 18,1991) focused on the U.S.'s role as a major exporter of medical technology. A trade deficit in this area exists only with Japan and West Germany (U.S. Department of Commerce data, 1988); who, interestingly, only rate second and third to the U.S. in the breadth of medical technology available (Rublee, 1989).

Three only partially answered questions, however, cloud this issue in terms of the future of radiography. First, to what extent will financial pressures limit technology development and utilization? For example, how much "pressure" on the GNP can health care costs continue to exert? The United Way report (1989) shows that expenditures will rise from twelve to fifteen percent of the GNP by the year 2000, with many receiving excellent high-tech care, yet some Americans do not receive the most basic of care.

The question of "how much" technology has never been adequately answered. The question is confounded by a variety of factors. Toffler (1980) chastizes "modern-day Luddites" who

criticize technology, seeking to regain the world they grew up in (see Honig (1985) for a similar critique in education of low-tech "Luddites"). Often they disguise themselves as "critical thinkers" seeking to improve the health care system of America. Those involved in radiology will remember how mammography "went out of style" for a number of years due to scares over radiation exposure. Only the risks were considered, not the benefits.

Wagner and Zubkoff (1978) feel that technology has received a bad name simply due to the fact that we never have quantified the health outcomes from technology. An interesting study would involve, for example, the expected changes in morbidity and mortality if the U.S. had implemented Bogue and Wolfe's (1976) moratorium on CT scanners, now a well-established modality. However, we simply go on implementing new technologies, which sometimes relegates premature obsolescene to established diagnostic tests and encourages premature adoption of new technologies (Sox, Stern, Owens, and Abrams, 1989).

When posed with the question of how much technology, Dr. Michael DeBakey answered as follows:

> I really don't know how much is enough technology. I can tell you this: When we're dealing with patients and when we're dealing with a patient's family, their response to this would be, "as much as is necessary to get our loved one restored to normal life." And that's about the only answer I can give (Inglehart, 1982).

The question of how much technology, especially "hard" technologies such as MRI scanners, is difficult to answer. A 1990

survey of the CEO's of America's 500 largest companies (William M. Mercer, Inc., 1991) indicated that they viewed expensive new technologies as the force that drove healthcare costs upward prior to 1990. However, they also felt that future costs would not be driven so strongly by technology but by an aging population and a view of health care as an entitlement. Previous articles reviewed here have indicated (eg., Ulschak and SnowAntle, 1990; Berk, Monheit, and Hagan, 1988) similar views.

Johnston and Packer (1987) believe that attempts to control costs by health care providers will encourage the implementation of technology and systems that "improve efficiency and reduce expenses, without sacrificing the quality of care." They find the fact that almost all of the $6 billion spent by the U.S. on health research goes toward "advancing medical knowledge and developing new, often expensive techniques for prolonging and improving life" as undermining the true objectives of a healthier nation. Technology will grow, especially the "soft" technologies; how much is unclear.

Second, can it be expected that a point of negative return will occur in which the role of the radiographer as skilled equipment operator is minimized? For example, an article on the "Hospital of the Future" in the Futurist described how information technology has led to the digitization of images (November-December,1990) - which means that less operator control may be necessary. Johnston and Packer (1987) describe a "Self-

Diagnostic Health Clinic" that would make routine treatment "cheaper, less time-consuming, more private, and more effective."

Most probably, this role will actually increase or maximize, though the how is unclear. For example, Long (1990) feels that digital imaging requires no less skill than other forms of traditional imaging. An interesting text in another field is Shoshana Zuboff's (1988) In the Age of the Smart Machine, which shows how information technology has changed company policy. One manager in the book stated that people with a higher level of education, more recent schooling, and mental discipline were in demand due to the changes information technology had made.

Finally, how much exposure can the radiographer be given, in a basic skills educational system, to advanced modalities? To what extent is multicompetency (the ability to operate in many modalities) possible? This is a term that is often talked about, especially among administrators of departments (eg., Conway and Buck, 1990), but it is unclear how much specialized training can be offered in a short period of time.

High Tech or High Touch Health Care?

A variety of recent articles have explored the need for health care professionals, especially those in technical professions, to emphasize more the caring nature of their

profession. In radiography, this is an unresolved issue extending back at least 20 years, when Ohnysty (1968) noted: "If we fail to motivate that feeling [empathy and compassion] and the earnest desire within our student to help our fellow man, we will have created the equivalent of human robots." Later McMartin (1988) noted that there is perhaps "something being overlooked in our training programs and in our certification process," quoting the following excerpt from a column in the Edmonton Journal:

> One thing sadly lacking in so many of those operating the new technical equipment is awareness of the patient's sense of awe and fear in the presence of, say, a gigantic CT scanner. They need warm reassurance and even better, the touch of a kind hand (author's emphasis), but the personnel in these areas rarely seem willing, or able to give either.

More recently, McKenna-Alder (1990) has stated that it is again time to "care about caring."She notes the following impediments to person-oriented caring: 1). Scarcity of time; 2). Being too busy with high-tech equipment; 3). A lack of training in caring for the critically ill or terminally ill patient; and 4). A lack of communication. Equipment has become our "physical and emotional barrier" to providing patient care.

These viewpoints reflect predictions made by Naisbitt in 1982 that as technology advanced, there was going to be an increasingly proportionate need for touch on the part of individuals. There would be an increased need to feel connected to other human beings, leading to the now well-known "high-tech - high-touch" dichotomy. The imposing nature of an MRI scanner, for

example, creates such fear and anxiety in a patient already compromised by fear and anxiety over his or her illness, that a technologist must actually provide a higher level of patient care than before. In a 1989 address to the Illinois Association of School Boards, Naisbitt claimed that the "big story" of the 1990's would be a reexamination of our humanity (Adkins,1989). He felt that the accelerating pace and complexity of modern life is upsetting our balance. More recently, Groff (1991) has stated that the "New Professional" - capable of visionary, proactive, and transformational leadership - will be taught excellence by integrating the caring dimension into learning.

Much of the health care literature has interpreted Naisbitt's "high-touch" statement figuratively. Thus, Albert (1989) believes that health-care institutions should emulate, or at least attempt to learn from, businesses such as McDonalds that analyze every possible means of customer satisfaction to remain competitive. In radiography, Callaway (1990) believes that, along with teaching students caring behaviors,students should learn the importance of affective behaviors in customer satisfaction in the health care environment.

Conway and Buck (1990), as part of a broader survey on the retention of radiographers and sonographers, used one very interesting possible response - I am treated like equipment - to which thirty-eight percent of the responding radiographers agreed.

These views - that health care professionals sometimes overidentify with equipment and are sometimes treated in the same way - is not new, but receiving new attention. In 1982 Savitt and Kopperl noted that nurses many years ago were "in the same boat," but had worked hard to overcome these stereotypical views. They cited this statement from a 1917 issue of the American Journal of Nursing as an example of nursing's early "enforced subservience":

> The first and most helpful criticism I ever received from a doctor was when he told me I was supposed to be simply an intelligent machine for the purpose of carrying out his orders.

Years ago nurses aligned themselves theoretically on the *expressive* side of Talcott Parsons' (1955) *instrumental-expressive* continuum, originally used to describe how the family helps the child in tasks of personal and social development. Parsons delineated the role of the father as instrumental or pragmatically concerned with the outside world. The mother was seen as expressive or internally concerned with the maintenance of supportive and integrative relations between family members.

Just as the family of today is not typically so strongly delineated, the profession of nursing has sought to integrate the expressive, person-oriented role with that of the instrumental, task-concerned role. McConnell (1990) has found that nurses working with high technology machinery and people (as in Intensive Care Units) can balance artistic or expressive concerns with scientific or instrumental concerns. She terms these

individuals "expert symphony conductors." One of radiography's challenges for the future may be to find that same balance.

In the subfield of radiologic technology of radiation therapy, Sobotor (1990) notes that programs can no longer afford to be evaluated simply on their ability to turn out entry-level graduates. This leads to an strict emphasis on technical competence that ill-suits a professional field. He feels that critical thinking skills and the non-technical aspects of the profession must be emphasized, giving graduates " sensitivity and understanding of the social milieu within which they practice."

AIDS was cited twice in the first portion of this review as a significant problem for the future. It has been shown that health professionals, including radiographers, have poor attitudes towards the AIDS patients and marginal groups such as homosexuals and IV drug abusers (see, for example, Dowd, 1991a; Dowd, 1991b). If this remains to be true, then certainly the care of such individuals will remain compromised. This is an important issue as it has been forecasted by the Hudson Institute that the number of HIV-infected individuals could reach 14.5 million by the year 2002, from today's level of 1.5 million (Johnston and Hopkins, 1990).

Review of Recent Articles in Radiologic Technology

Topical Review of Journal Articles in Radiologic Technology

A topical review of articles found in the three major *peer-reviewed journals covering the field of radiography* was performed - Radiologic Technology, Radiology Managment, and Administrative Radiology. Radiologic Technology, the official journal of the American Society of Radiologic Technologists (ASRT), is aimed primarily to the practitioner/leader in the field, with some articles on education and management. Radiology Management, the official journal of the American Healthcare Radiology Administrators (AHRA), focuses primarily on topics of interest to managers of radiology departments. This organization interestingly changed its name in the mid-1980's from Hospital to Healthcare to reflect the growing trend that not all administrators worked in hospital radiology departments, but a variety of other facilities such as outpatient clinics and freestanding MRI centers. Administrative Radiology, formerly associated with the Association of Educators in Radiologic Sciences (AERS), publishes articles for managers of radiology departments, radiologists, and educators in the radiologic sciences.

Articles that appeared to have relevance to the future radiographer were reviewed, Three hundred and thirty-one articles

appeared in Radiologic Technology in this five year period; 195 in Radiology Management; and 325 in Administrative Radiology.

Articles related to computer technology dominated these journals, with thirty appearing in Administrative Radiology; twenty-four in Radiologic Technology; and sixteen in Radiology Management. Second most common were articles focusing on caring/ customer satisfaction, with thirteen articles appearing in Radiologic Technology; thirteen in Radiology Management; and ten in Administrative Radiology. Third most common topic relevant to the radiographer of the future were articles on AIDS. Seven appeared in Radiologic Technology; four in Administrative Radiology, and two in Radiology Management.

No articles discussing the manpower shortage appeared in Radiologic Technology. Ten articles on this topic appeared in Radiology Management and five in Administrative Radiology. It should be noted, however, that Radiology Management, as the main organ of the AHRA, has been designated to serve as the main means of disseminating reports of the Summit on Manpower, a multi-organizational group seeking to find ways to solve radiology's manpower shortage. Also, although five articles discussed multicompetency in Radiology Management, none did so in either Radiologic Technology or Administrative Radiology. Quality, on the other hand, received an exceptionally strong focus in Adminstrative Radiology during this time period, with nineteen

articles covering this topic. Only four articles discussed this issue in Radiology Management and two in Radiologic Technology.

Futurism as a topic received little attention in these journals. Only one article on this topic appeared in Radiologic Technology, three in Radiology Management, and two in Administrative Radiology.

Registry Statistics

Radiologic Technology regularly publishes a column entitled "Re:Registry" which outline topics of interest regarding the national certification examination offered by the American Registry of Radiologic Technologists. In the column appearing in the January/February 1991 issue, Reid notes that no comprehensive summary of demographic statistics regarding registrants has appeared in the journal since 1972. That article, and the next two articles, sought to alleviate that deficit.

There are 167,000 total certificates in radiography; 175,000 in all disciplines (all numbers are rounded by Reid). In radiography, there is a female to male ratio of seventy-five to twenty-five percent. This has not changed to any degree since 1972. The average age of a radiographer is 36.6 years.

In the next column Reid (1991) noted that one large change has occured, namely that the percentage of radiographers working in hospitals declined (from 72% to 65%). More males than

females, percentage-wise at least, work in the hospital setting (80% to 60%).

In the final column devoted to demographics, Reid (1991) noted that eighty-nine percent of radiographers were white, five percent black, three percent Hispanic, one percent Oriental, one percent "other" and less than one percent Indian. The average age of examinees increased from 23.2 to 25.2 in the most recent four-year period.

Radiology Department of the Future

Little in the literature has analyzed trends in radiology with a forward, rather than current look. Wold (1990) identified the following trends as leading to change in radiology departments by the year 2000:

1. First and foremost, picture archiving and storage (PACS) and other digital forms of imaging would change the way films are taken, processed, and stored.
2. Magnetic resonance imaging (MR) and computed tomography (CT) will grow, with CT being the "workhorse" of diagnostic imaging.
3. Radiography is among the top ten growth professions, a trend that will continue through the year 2000.
4. Mammography will grow. Proof of quality will be required of operators and equipment, with mammography

being viewed as a major tool in health promotion/ disease prevention.

5. The shift to outpatient care will continue.
6. It will be recognized that there are two basic consumers for radiology services - the patient and the referring physician.
7. Technology will continue to improve, with the real question being "how we apply the technology."

In concluding, Wold felt that the radiographer of the 90's and beyond would require superior technical skills as a primary attribute, and a "positive," customer-oriented attitude that focuses on the patient.

A Vision of the Future in Education

The Commission on the Future of Community Colleges, in their Building Communities report (1988), identified six components of the movement or mission of building communities:

1. Partnerships for learning with students and faculty.
2. Curriculum: From literacy to lifelong learning.
3. The Classroom as Community.
4. The College as Community.
5. Connections Beyond the College.
6. Leadership for a New Century.

The strongest foci in the report were the need for assessment and outcomes measures to show accountability. The

conceptual use of "community" in the report is attractive to community college educators as it speaks to the heart of the mission of most community colleges.

Morris (1989), in the introductory article to a text covering community college futures, feels that institutions must consider a variety of prescriptive thoughts in creating an action agenda for "Future-Oriented Community Learning Systems":

1. Take a global view.
2. Focus on students and their life enhancement.
3. Reaffirm the importance of the collegial tradition.
4. Ensure academic quailty of the liberal arts.
5. Reconstitute the curriculum.
6. Commit to quality as a fundamental landmark.
7. Devise ways to ensure overall organizational effectiveness.
8. Professional development is of the utmost importance.
9. Articulate - downward, upward, and sideways.
10. Values should match philosophy.

Parnell's Dateline 2000 (1990) has quickly become the text identifying "the environmental, societal, and demographic changes that will confront us in the 1990's." Parnell asks, and gives preliminary answers to, nine questions:

1. Will there be rich possibilities in the 1990's for colleges and universities?

2. What is the linkage between the economy and higher education?
3. How will international and intercultural forces impact higher education?
4. How can higher education better serve that segment of the population considered undereducated and disdavantaged?
5. How can colleges and universities respond to insistent political demands for accountability?
6. What is the role of colleges and universities in developing a sense of civic responsibility among college students?
7. How will demographic shifts impact colleges and universities in the decade ahead?
8. What will be the impact of technological developments upon higher education institutions?
9. How do we finance higher education in democratic society?

Parnell notes that liberal arts and technical education were going to become more integrated; and technical changes would make educational institutions search for synergy. He spoke of an "umbrella external force"- the link between the economy, education, and human resource development that was assuming new importance each day. He also notes that the search for

accountability was going to continue to confound education. In many ways, his view can be analogized with the "Building Community" concept in terms of a search for synergy and linkages.

A Vision of the Future Radiographer

The following is a synthesized vision, based on the previous literature review, of the future radiographer. The radiographer of the future (year 2000 and beyond) will be expected to be multicompetent, or at least able to achieve multicompetency. This individual will be expected to have strong computer skills related to information systems and the profession.(Zuboff,1988;Bezold, 1989; Elder, 1990; Long, 1990; Wold, 1990). In all situations, the application of technology through critical thinking skills (which can be analogized with the "basic skills" discussed by Parnell (1990)) will be of major importance (Sobotor, 1990; Dowd,1991).

The radiographer of the future working in a hospital setting will be expected to work with a variety of very frail patients - the very old, the prematurely born, and AIDS patients (Dowd, 1990; Elder, 1990; Johnston and Hopkins, 1990; Ulschak and SnowAntle,1990; Selker and Broski,1991). Chronic patients will dominate the hospital setting. Working in a hospital setting may lose its glamour, and graduates may view outpatient settings as prime employment settings (Wold, 1990; Reid, 1991). Thus, the manpower shortage (Conway and Buck, 1990; Ulschak and SnowAntle,

1990) may be more acute in hospitals, which will add further burdens to the special skills that will be required for hospital radiographers.

In all cases, radiographers will be expected to balance the "hard," "scientific," or "instrumental" aspects of their professional practice with the "soft," "artful," or "expressive" nature of the profession (McMartin, 1988; McKenna-Adler, 1990; Sobotor, 1990). Quality will be a key term - radiography students will expect increased quality of instruction, on their terms, from instructors and programs (Building Communities, 1988; Parnell, 1990) and as graduates they will be expected to provide quality, consumer-oriented care (Albert, 1989; Callaway, 1990). This will be on the patient's terms, which means that radiographers will have to pay increased attention to the situation-specific nature of health care. Radiography will have to find more ways to become involved in issues such as health promotion/disease prevention (Bezold,1989; Elder,1990) to show that they have concerns with the patient's health beyond technical execution of films.

The typical radiographer will continue to be female, less likely white, and socially involved with a variety of family responsibilities (Johnston and Packer, 1987; United Way report, 1989; Reid, 1991). The typical radiographer will also be somewhat older than previously, when "old" radiographers were uncommon

(Johnston and Packer, 1987; United Way report, 1989; Reid, 1991). More older students will enter the profession (Parnell, 1990; Reid, 1991), and more individuals will stay in the profession for a number of years.

Using Visions of the Future for Human Resource Planning

The need for improved human resource planning is evident throughout the public and private sectors. Jack Welch, Chief Executive Officer of General Electric and the 1991 winner of the American Management Association's CEO of the Year Award, notes that the early 80's were a "hardware decade" (USA Today, July 15,1991). Now we are in what he calls a "software" decade, where "everything is in place" and "soft" issues such as the development of human resources are of primary importance.

Pinchot (1991) has criticized Welch for only paying attention to these issues when they became important to the "bottom line." True intra- and entrepreneurs are, according to Pinchot, "dreamers that do," translating vision into action. Pinchot's entrepreneurial grid is similar to Groff's (1991) leadership grid, in which analysis, evaluation, and creative futures visioning lead to transforming vision into actions.

Groff (1979) has noted that strategic planning should serve both the institution and the individual. Groff (1983) has defined strategic planning as a "process of matching results of an assessment of an external environment as well as a way to

audit their [colleges'] internal strengths and weaknesses. By combining an external assessment (such as future roles of practitioners) with the human resource needs of faculty the combined resources of the institution are best utilized. In 1982 Groff noted that institutions and individuals need a way to anticipate the future in terms of a conceptual framework that assesses opportunities and threats in the external environment and internal strengths and weaknesses.

Schein (1978) has developed a model matching organizational needs and issues to the needs of the individual. This occurs through a variety of matching processes which diagnose areas for improvement, leading to the formulation of strategic plans. Groff (1990) has related this matching process to human resource development, in which the diagnostic/developmental level of the individual is matched with the diagnostic/developmental level of the institution. Herrscher (1991) also has noted that frameworks will be necessary in a future environment due to the large amount of information that must be processed, and dealt with in a usable manner.

Lincoln Land has developed a similar matching strategy for its professional development programs. All professional development must meet stated goals and program/instructional needs (Lincoln Land Professional Development Program Handbook, 1990). The process is as follows:

Step One - Planning

An advisory group works with the faculty member to develop a plan. The presence of a dean on the committee is necessary to ensure that plans meet program/instructional needs.

Step Two - Submitting

The dean submits the plan to the Professional Growth Committee.

Step Three - Evaluating

The plan is evaluated by the committee; which offers suggestions and chooses to approve or not approve the plan.

Step Four - Implementing

If approved, the grantee works with the advisory group to implement the proposal.

Step Five - Monitoring

A brief written report is submitted to the committee each year.

Groff (1989) quotes Toffler (1980) as stating that "All education springs from some image of the future." Imagination and creativity are of the essence in planning for the "alternative future." To plan or study the future requires forecasting what can be (possible futures); what is likely to be (probable futures); and what should be (preferable futures). Thus a human

resource plan that 1). meets institutional and personal/ professional goals; and 2). is based on a vision of the future, has a good probability of meeting the needs of the college and faculty member (internal environment) as well as societal needs (external environment).

Conclusion/Summary

This review of the literature synthesized data from a variety of sources to develop a vision of the radiographer of the future (beyond the year 2000) and to provide the conceptual basis to use this vision in human resource planning in a radiography program sponsored by a community college and hospital.

Chapter 3

METHODOLOGY AND PROCEDURES

Problem-Solving Methodology

Using the development problem solving methodology, this practicum addressed the question, "What is an effective and valid strategic action plan for the human resource development of the Lincoln Land/St. John's radiologic technology program faculty and staff in relation to the practitioner of the future?" Groff's (1982; 1989) view of planning for the future by forecasting possible and probable futures (the future radiographer) in relation to the preferable future (an HRD plan designed to meet this challenge) was the conceptual basis for this study. The steps in the process were:

1. A review of the related literature (Chapter 2);
2. Validation of this vision of the future by a formative committee, a selected panel of experts in the field;
3. The development of a human resource development plan based on this vision; and
4. The approval of the plan by the program advisory committee, and validation of the plan by a small sub-group (three members) of this committee.

These steps are further described below.

Literature Review

The literature was reviewed to 1). come to a vision of the future radiographer, and 2). Describe the use of futurism in human resource development planning. The synthesized vision of the radiographer came from 1). a general futures vision; 2). a vision of the future in health care and allied health; 3). a review of articles from the field of radiologic technology; and 4). a vision of the future in education. The use of futurism in human resource planning focused primarily on Groff's (1979, 1982, 1983, 1986, 1989, 1990) matching processes and described the institution's similar use of a matching process in human resource development.

Formative Committee

A committee of experts was formed to evaluate the vision of the radiographer of the future developed from the literature review. The program director selected the five members of the formative committee. The committee provided input on the validity of the vision through commentary. All of the volunteers had expertise in the field of radiography and/or the health professions. Two individuals were administrators of radiology departments in Springfield, Illinois; one was an educator and former program director of a radiography program in Chicago,Illinois; one was a registered radiographer enrolled in a health services administration program at the baccalaureate

degree level; and one was the dean of a College of Health and Human Services with experience in working with radiography programs. A sample letter to committee members is contained in Appendix A.

Human Resource Development Plan

The human resource plan was developed based on the vision of the radiographer of the future. It was integrated with the previous human resource plan (Appendix B), and can be found in Appendix C.

The methodology for developing the human resource plan was based on Groff's (1982) method. This method of integrating futurism into human resource planning involves the development of 1). major assumptions; 2). major goals; and 3).priorities. Though Groff identified the four highest priorities in an annual plan, there is no attempt here to limit the plan to four priorities as it is a multi-year, open-ended plan. Also, a final section describing the use of the plan to increase institutional effectiveness (Groff,1990) was included.

Groff's definition of assumption is a "proposition describing future conditions, some of which the institution has little control over." He feels that specifying assumptions "helps to clarify the fuzzy images of alternative scenarios of the future and helps to sharpen the focus of goals and objectives." Thus, the methodology used in the development of this plan uses

assumptions as diagnosis. These assumptions lead to major goals common to the institution and individual, allowing a program or institution to prioritize those goals in the form of a long or short term plan.

Summative Committee

The summative committee, which also serves as the advisory committee to the program, was given the opportunity to view the plan in advance of a regularly scheduled advisory committee meeting and met during a regular advisory committee meeting to discuss and approve the plan. This committee was also given the opportunity to review the "Vision of the Future Radiographer," as well as the steps involved in developing the human resource development plan. The advisory committee has the authority to recommend policy for the program to be presented to the Board of Trustees, the Curriculum Committee, and the Professional Development Committee of the college.

This committee consists of one technologist, one student, two administrative directors of radiology departments, two hospital assistant administrators, two Lincoln Land deans, a community member, and two faculty. The program director "chairs" the committee unofficially; that is, presents material for consideration by the committee.

A Likert-type questionnaire (Appendix D; adapted from Zimbaro, 1991) was used to validate the plan. Three members of the advisory committee were selected to validate the plan: one

faculty member, the Dean of Applied Sciences, and the Assistant Administrator for Human Resources and Education at the clinical site.

Assumptions and Limitations

Assumptions

1. Assumptions for the scenario of the future are listed in Appendix B.
2. It is assumed that the judges on the formative and summative committees provided competent, professional, and valid review.
3. It is assumed that Groff's (1979, 1982, 1983, 1986, 1989,1990) methods of strategic planning and integrating futurism into the planning process have utility in radiography program planning.

Limitations

1. This is evidently the first time that such research has been attempted in radiography, which gives little indication to its applicability.
2. Bezold (1989) notes that futures planning must be careful to make only assumptions that are supported by the data available. It is easy to extrapolate trends that do not exist, or as Siegfried (1991) notes, "It's always risky to put something in writing, especially if what you have written is about the future."

3. Unknown factors can render forecasting inaccurate, even when the current database seems solid. Sanchez (1991) notes that the 1981 report Florida's Decade of the Eighties was unable to forecast the strong impact AIDS would have on the state's healthcare system as it was an unknown disease at the time.
4. The need to integrate and synthesize so much data from so many sources, as well as eliminate data from a variety of sources, potentially limits the validity of the analysis. For example, the topical review topics were author-chosen.
5. It is not known to what extent national trends can be seen as directly applicable to a radiography program in Central Illinois.

Definition of Terms

1. Human Resource Development - the recruitment, supervision, staff development , and evaluation of personnel in educational institutions (Groff, 1990).
2. Human Resource Development Plan - as used in this report, refers to the use of strategic planning to develop a plan for the effective utilization of human resources (especially faculty development) in a college.

3. Futurism - as used by Groff (1982) in relation to strategic planning in education, the gathering of "demographic, social, economic, and governmental trend analysis data to develop specific alternative scenarios for the institution."
4. Strategic Planning - a process of matching results of an assessment of an external environment as well as a way to audit [colleges'] internal strengths and weaknesses (Groff, 1983).

Chapter 4

RESULTS

Formative Committee

The vision of the radiographer of the future was revised once based on input provided by the committee. This input was solicited by mail or in person. The committee provided useful review and direction, especially in suggestions for new areas to review in the literature and in areas that had perhaps not received sufficient focus in the literature.

Human Resource Development Plan

The integrated human resource plan consisted of four components. First, seven major assumptions based on the view of the future radiographer described in the literature review were developed. From these seven assumptions five goals for the program were developed. Then these goals were integrated with goals from the previous plan, leading to six human resource priorities for the radiography program. Finally, a section related to evaluation (use of the plan to improve program effectiveness) was developed.

Summative Committee

The plan was approved by the summative committee. Now requests for professional development that meet the criteria set forth in the human resource plan can be considered approved by the advisory committee, which is necessary for all programs

having an advisory committee. The majority of the rationale required for professional development requests has been done in advance, which means that a faculty member must only justify the request in terms of criteria already set forth. Such proposals are directly submitted to the Professional Development Committee (Step Three of the process), and the program advisory committee will work with the faculty member in implementing the plan.

Results of the responses to the Likert-type questionnaire administered to three members of the advisory committee are summarized in Table 1. All respondents agreed that the plan, in general, met the criteria set forth in the questionnaire. No disagreements were received. Comments received included:

> This is a perfect plan for a four-year program, and I would have given it all "5's" in that case. However, I wonder how well a two-year program could meet these goals. In fact, this plan reassures the need for radiography programs to move to the baccalaureate degree (Scores given by this individual : 4,4,3,3,4,3,4).
>
> I feel that mandating counseling would increase our liability risks due to credibility.

Table 1

Responses to the Evaluative Questionnaire

n = 3

Question*	SA	A	N	D	SD**
1. Validity of assumptions.	2	1			
2. Validity of goals.	2	1			
3. Validity of priorities.	1	1	1		
4. Translate into action strategies.	1	1	1		
5. Broad basis.	2	1			
6. Contains evaluation strategy.	2		1		
7. Holistic nature of plan.	2	1			

* see Appendix D for complete questions.

** SA = Strongly Agree
A = Agree
N = Neutral
D = Disagree
SD = Strongly Disagree

Chapter 5

DISCUSSION, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Discussion

This practicum matched information (literature review) with a method of human resource development planning developed by Groff (1979, 1982, 1983, 1986, 1989, 1990). Education stems from a view of the future (Toffler,1980), and this practicum attempted to come to a view of this future in order to bring about purposeful change. The review of the literature showed tremendous, perhaps even violent change on the horizon for the country, healthcare, education, and the relatively small field of radiologic technology. Such change will be best managed by institutions able to analyze trends and look to the future with confidence in their abilities to meet the challenge of change.

Toffler (1980); Groff (1982); Pinchot (1991); and Herrscher (1991) have all noted that conceptual frameworks are necessary to analyze and evaluate information in a manner that leads to futures visioning with a transformation of vision into action. The goal of this practicum was to utilize such a framework for futures planning.

Conclusions

Groff's (1982,1989) methods of human resource planning and planning for the future by forecasting possible and probable futures in relation to the preferable future has proven to be of value in a preliminary manner. Based on the opinions of knowledgeable judges, the vision and plan were valid.

The ability of the plan to translate into action strategies was seen as the weakest aspect of the plan (1 strongly agree; 1 agree; and 1 neutral). The validity of priorities was also evenly split between these three categories. Evaluators were consistent with one individual providing all the "neutral" responses. This individual stated that it would have been a "perfect" plan for a four-year program, but was limited in its applicability to an associate degree program. This raises questions of philosophical orientation as to the potential of a two-year program.

The fact that two individuals strongly agreed that the evaluation strategy was in place, but one individual also rated evaluation as neutral, raises questions that should be considered in the implementation of the plan, but are unanswerable with such a small sample. All evaluators on the summative committee agreed that the plan had a broad basis and was holistic in nature, with valid assumptions and goals.

Implications

Human resources, as Morris (1989) notes, are the most important resource of a college. The method of human resource development planning utilized here is worth the effort necessary for development, implementation, and evaluation.

For example, it would have been difficult for a faculty member to request additional training in the area of ultrasonography, which requires at least three months of additional training. However, with multicompetency identified as a means of increasing the employability of graduates, if the program can offer additional training in this area to students (through a trained faculty member), then the cost to the college may be worthwhile. Also, the identification of the manpower shortage, validated by local expert opinion, may encourage the program to increase student capacity (which would require hiring an additional faculty member). Such synergism, noted as necessary by Parnell (1990), has been brought about by applying principles from the human resource seminar and in this practicum, matching organizational development with human resource development (Groff, 1990).

The implications of this practicum to the administration and faculty are clear - instead of engaging in enforced, unplanned, reactive "planning," the opportunity now exists to use a vision of the future to plan in advance. Proactive planning

makes the best use of the limited resources - human and fiscal - available to an institution.

Recommendations

This project will be implemented immediately, forming the official human resource development plan for the radiography program. As the official human resource development plan, it becomes part of the program Master Plan, which contains the goals, objectives, curriculum, and evaluation strategies for the program. The program director will be responsible for ensuring that this plan is implemented, and the plan will also be evaluated by the advisory committee on an "as necessary" basis, as well as being evaluated during the next review of the program for accreditation. One item that should be a strong focus is how well the plan leads to specific action strategies and the validity of priorities, which received the lowest rating by the sub-grouping of the summative committee.

Additional research should be conducted in terms of continually upgrading the database. That is, as a long-term plan, there are many limitations (see the limitations section). Also, a long-term follow-up of the effectiveness of the plan will give direction in modifying the methodology used. Finally, the information from this practicum will be used in other planning done by the program, and it is expected that the literature review section of this paper will form the basis for a scientific

paper to be presented at the Annual Meeting of the Illinois State Society of Radiologic Technologists (as well as a brief description of the plan). Other potential means of dissemination would include the journal or Annual Meeting of the American Society of Radiologic Technologists and the journal of the American Healthcare Radiology Administrators.

This information will also be made available to students and the community. Current students will learn from this: 1). their future roles as radiographers, and 2). how the program is preparing them for this role. Prospective students and the community will be informed of the forward-looking nature of the program through the program brochure.

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APPENDIX A

SAMPLE LETTER TO FORMATIVE COMMITTEE

6-25-91

Bonnie Wold, R.T.(R)
Memorial Medical Center
Radiology Department
800 N. Rutledge
Springfield,IL 62702

Dear Bonnie:

As part of the requirements for my doctoral degree in higher education I am working on a project that delineates a human resource development plan in relation to the practitioner (radiographer) of the future. In our profession, as you know, we are often battling to simply "keep up" with a multitude of technological and social developments. I believe that futures planning is imperative for our profession.

I have a request that I would like to make of you for this project. Would you be willing to serve on a formative committee that would evaluate my view of the "radiographer of the future?" Your commitment would be to read and comment on a literature review of about ten pages that would include information from a variety of sources.

Thank you very much for considering this request and I hope that I will be able to make use of your professional expertise.

Sincerely,

Steven B. Dowd, M.A.,R.T.(R)
Radiography Program Director Lincoln
Land Community College/St. John's Hospital
800 E. Carpenter
Springfield, IL 62769

APPENDIX B

ORIGINAL HUMAN RESOURCE PLAN

This human resource plan was developed in the Human Resource Development Seminar offered by Nova University. Following a human resource audit, and an assessment of the internal/external environment of weaknesses, opportunities, threats, and strengths, this plan, based on the Essentials and Guidelines for an Accredited Program in Radiography, was developed:

Six Identified Goals

1. Relating professional development to three areas: Imaging, Instructional, and Evaluative Techniques.
2. Relating professional development to self-identified goals, program goals and outcomes, and instructional evaluation process.
3. Professional development must be performed for all associated with the program.
4. Interview system for follow-up must be implemented.
5. Counseling skills are required for all faculty.
6. An outcomes orientation must be understood and internalized.

Human Resource Plan

1. Program director will evaluate professional development to ensure it meets activity requirement.
2. Personal goals must be set and related to HRD and institutional goals.

3. Faculty evaluation process will be used to evaluate professional development needs.
4. Clinical staff will receive inservice three times per year; policy updates; and one-time outcomes lecture.
5. Interview system for entry, first-year, and exiting students will be implemented in August.
6. Faculty member lacking counseling course will be required to take one.
7. Yearly faculty inservice on accreditation and outcomes.

Use of the Plan to Improve Institutional Effectiveness

A one hundred percent compliance with the plan is expected to improve the effectiveness of the program and meet accreditation essentials and guidelines. Compliance with the above plan will be evaluated on a yearly basis (each June) by the program director, as well as an initial six-month evaluation to chart the progress of the plan. This will be documented, as per accreditation guidelines, in the program Master Plan.

APPENDIX C

PRESENTATION TO ADVISORY COMMITTEE:

INTEGRATED HUMAN RESOURCE PLAN

An Integrated Human Resource Plan Based on Future Trends

And Accreditation Guidelines

Presented to the Radiography Advisory Committee

Major Assumptions

1. Computer skills related to imaging and information systems will continue to take increasing importance.
2. The patient population will continue to shift toward the very old, very young, and very frail/sick.
3. The manpower shortage will continue.
4. Multicompetency will be a major selling point for graduates.
5. Radiographers will be expected to be skilled in the application of technology.
6. "Soft," "caring," or "customer satisfaction" issues will increase in importance.
7. Radiography students will be female, predominantly white, and older.

Major Goals

1. Vitalize the computer literacy portion of the curriculum.
2. Ensure that the curriculum focuses on basic skills/ technology application.
3. Revise curriculum to focus on "newer" aspects of patient population.
4. Institute multicompetency options in curriculum.
5. Review program to ensure that needs of adult learners are being met.

Human Resource Priorities

1. Train faculty toward multicompetency.
2. Ensure that computer skills of all faculty meet the needs of imaging and information systems. Professional development in the accreditation category of "Imaging" should fit in this category, as well as priority #4.
3. Ensure faculty sensitivity to adult student needs (Counseling course mandated in previous human resource plan will fulfill this requirement).
4. Ensure that faculty understand and implement basic skills/ competency based education philosophy (Accreditation category of "Evaluation" and "Instruction").
5. Develop faculty skills toward meeting needs of "new" patient population.
6. Train clinical staff in program policy on a regular basis (three times per year).

Use of the Plan to Improve Institutional Effectiveness

A one hundred percent compliance with the plan is expected to improve the effectiveness of the program and meet accreditation essentials and guidelines. A less than one hundred percent compliance will require justification. Compliance with the above plan will be evaluated on a yearly basis (each June) by the program director, as well as an initial six-month evaluation to chart the progress of the plan. This will be documented, as per accreditation guidelines, in the program Master Plan.

Faculty will be encouraged to submit professional development plans through the professional development committee. Activities that meet the above criteria will be considered to have the approval of the advisory committee.

APPENDIX D

QUESTIONNAIRE ADMINISTERED TO ADVISORY COMITTEE SUB-GROUP

Please evaluate the "Integrated Human Resource Plan" based on the following criteria. Circle a "5" if you strongly agree, a "4" if you agree, a "3" if you are neutral, a "2" if you disagree, and a "1" if you strongly disagree.

	SA	A	N	D	SD
1. The major assumptions set forth in the plan are valid.	5	4	3	2	1
2. The major goals set forth are valid, and based on the assumptions.	5	4	3	2	1
3. The human resource priorities set forth in the plan are valid, and based on the goals.	5	4	3	2	1
4. The human resource priorities can be translated into specific action strategies.	5	4	3	2	1
5. The plan is broad enough to meet the goals of the institution and individuals, as well as accreditation mandates.	5	4	3	2	1
6. The plan contains a viable evaluation strategy.	5	4	3	2	1
7. Holistically, the document represents a valid human resource plan for moving the program into the 21st century.	5	4	3	2	1

8. I recommend the following changes to the plan:

9. I would add or delete the following: